

The geoglyphs of Titicaca

Original

The geoglyphs of Titicaca / Sparavigna, Amelia Carolina. - In: ARCHAEOGATE. - ISSN 1973-2953. - ELETTRONICO. - 13-10-2010(2010).

Availability:

This version is available at: 11583/2374703 since:

Publisher:

Archaeogate

Published

DOI:

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Possible Geoglyphs Spotted in Peru

A huge network of earthworks, or geoglyphs, is visible in satellite imagery of a large area around Titicaca Lake, a researcher claims.

By [Rossella Lorenzi](#) | Thu Oct 14, 2010 10:02 AM ET

An Italian researcher may have discovered a huge network of earthworks representing birds, snakes and other animals in Peru, according to a study published on the Cornell University [physics website arXiv](#).

Amelia Carolina Sparavigna, assistant professor at the department of physics of Turin's Polytechnic University, used Google satellite maps and AstroFracTool, an astronomical image-processing program which she developed, to investigate over 463 square miles of land around Peru's Titicaca Lake .

She says she has identified shapes that were built by Andean communities centuries ago.

Geoglyphs..or just agriculture? See the photos, judge for yourself.

"This region is covered by terraced walls and raised fields, which are large elevated planting platforms with canals in between. The earthworks represent an almost unimaginable agricultural effort to improve soil, temperature and moisture conditions for the crops," Sparavigna told Discovery News.

According to the researcher, enhanced satellite imagery revealed that some of the land forms are not only the remains of an extensive ancient agricultural system, but also those of formations designed to represent birds, snakes and other animals.

"They seem to be geoglyphs," Sparavigna said.

Geometric lines and images of animals that are best viewed from the air, geoglyphs are well-known in South America. Among the more famous geoglyphs are the Nasca Lines on the south coast of Peru and ring ditch sites in the Bolivian Amazon and Acre, Brazil. They feature impressive circular, oval, rectangular, square and D-shaped patterns.

"Past Andean and Amazonian societies imposed order, structure and aesthetics on nature through intentional design, engineering, and activities of everyday life," anthropologist Clark Erickson of the University of Pennsylvania told Discovery News.

"They created a complex environment of fields, paths, roads, canals, shrines, ceremonial centers, and settlements. One expression of this landscape transformation was the creation of geoglyphs or patterns made in earthworks," Erickson said.

The author of "Landscapes of Movement: The Anthropology of Trails, Paths, and Roads," Erickson conducted extensive research in the 1980s on the raised fields investigated by Sparavigna.

The landforms, "waru waru" or "suka kollus" as the farmers called them, were appropriate for agriculture. The canals in between the cultivated platforms provided a local micro-environment able to reduce frost risks for crops, while water in the canals and in ponds was probably used to cultivate aquatic plants and fish, as well as attract lake birds.

"These earthworks provide evidence for the impressive engineering abilities of the people who lived there in pre-Columbian times," Sparavigna said.

Built by excavating parallel canals and piling the Earth to form long and low mounds, the raised

fields featured different forms and sizes. They were about 4 to 10 meters (13 to 32.8 feet) wide, 10 to 100 meters (32.8 to 328 feet) long, and 1 meter (3.2 feet) high.

Sparavigna believes that these elaborate earthworks were planned following the natural slope of the terrain while incorporating symbolic meaning.

According to the researcher, who recently discovered an impact crater in the Bayuda Desert in Sudan using Google Maps, several images seem to depict birds, with ponds representing their eyes.

Others appear to depict snakes, tortoises, fish, armadillos but also "abstract drawings," with patterns of stripes and other objects less easy to identify.

"The patterns are complex and some of this structure certainly reflects Andean concepts of cosmology, deep structure, social organization, measurement systems and art," said Erickson.

But he questioned Sparavigna's interpretation of the earthworks.

"The identifications of particular symbols such as birds, snakes, etc. are not convincing. For example, what appears to be 'a bird wing' in one image, is a modern plowed field with stacks of drying barley or wheat," he said.

According to Sparavigna, Erickson's observation indicates that superimposed modern cultivations pose a threat to the geoglyphs.

"Modern agriculture can easily destroy them," said Sparavigna.

Gary Francisco Mariscal Herrera, the regional director of the National Cultural Institute of Puno, told the local radio station Onda Azul that the area might be soon declared a cultural heritage site in order to preserve the ancient structures.
